

THAT WHICH IS CLAIMED:

1. A transmitter for removing at least some out of band signals from a transmitted output signal having a predetermined bandwidth, comprising:

5 a phase modulator for receiving a signal and modifying the phase of the signal;  
a power amplifier for receiving the phase modified signal from the phase modulator and amplifying the phase modified signal;

10 a amplitude modulator for receiving the amplified phase modified signal and modifying the amplitude of the amplified phase modified signal, wherein the phase modification provided by said phase modulator and the amplitude modification provided by said amplitude modulator cooperate to filter out of band signals from the transmitted output signal.

15 2. The transmitter according to claim 1, further comprising a non-linear element, wherein amplitude modulator is downstream of said non-linear element.

3. The transmitter according to claim 1, further comprising a non-linear element, wherein the phase modulator is upstream of said non-linear element.

20 4. The transmitter of claim 1, further comprising an upconverter for mixing the phase modified signal with a carrier signal at a carrier frequency prior to the amplitude modulation.

25 5. The transmitter of claim 1, wherein the power amplifier is a non-linear power amplifier and the amplitude modulator directly modulates the non-linear power amplifier.

6. The transmitter according to claim 1, wherein the amplitude modulator comprises a digitally controlled attenuator.

30 7. The transmitter according to claim 1, wherein the amplitude modulator comprises a attenuator with analog control.

8. A method for removing at least some out of band signals from a transmitted output signal having a predetermined bandwidth, the method comprising:

- modifying the phase of a signal;
- 5 amplifying the phase modified signal; and
- modifying the amplitude of the amplified phase modified signal, wherein the phase modification and said amplitude modification cooperate to filter out of band spectral signals from the transmitted output signal.

10 9. A method according to Claim 8 further comprising mixing the phase modified signal with a carrier signal at a carrier frequency prior to the amplitude modification.

10. A method according to Claim 8 wherein the phase modification comprises modifying the phase of the signal prior to subjecting the signal to non-linear elements, and wherein the amplitude modification comprises modifying the amplitude of the signal following operation of any non-linear elements.

11. A method for removing at least some out of band signals from a signal output by a transmitter including at least one non-linear element, comprising:

- 20 for each of a plurality of different input signals, predetermining an amplitude modification and a phase modification of the respective input signal which would remove at least some out of band spectral signals from the transmitted output signal;

- storing the amplitude and phase modifications for each of the plurality of different input signals;
- 25 independently applying the amplitude modification and the phase modification to the input signal, wherein applying the amplitude modification comprises applying the amplitude modification after all non-linear elements of the transmitter.

12. The method of claim 11, wherein applying the phase modification comprises applying the phase modification prior to the non-linear elements of the transmitter.

13. The method of claim 11, wherein the transmitter comprises a non-linear power amplifier, and wherein applying the amplitude modification comprises applying the amplitude modification by directly modulating the non-linear power amplifier.

5 14. A transmitter for improving the spectral characteristics of a transmitted output signal, comprising:

a modulator, the modulator receiving a digital signal sample and subjecting the digital signal sample to a first filter for determining phase shift and amplitude variation information produced by the filter;

10 a table for storing the phase shift and amplitude variation information, wherein phase shift and amplitude variation information is received from the table in response to a digital signal input, such that the phase shift and amplitude variation information can be independently applied to the digital signal input to produce a modulated signal, such that the filter can be eliminated.

15 15. The transmitter of claim 14, further comprising a second filter in communication with the first filter, wherein the second filter reduces the power spectrum of the output signal.